

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Translation

509,175

PCT/EP2003/004435



Applicant's or agent's file reference B01/0906PC	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/004435	International filing date (day/month/year) 29 April 2003 (29.04.2003)	Priority date (day/month/year) 30 April 2002 (30.04.2002)
International Patent Classification (IPC) or national classification and IPC C07C 7/08		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 24 September 2003 (24.09.2003)	Date of completion of this report 12 November 2003 (12.11.2003)
Name and mailing address of the IPBA/EP	Authorized officer
Facsimile No.	Telephone No.

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International application No.

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## I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

- ☐ the international application as originally filed.
- ☒ the description, pages 1-13, as originally filed,  
 pages \_\_\_\_\_, filed with the demand,  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the claims, Nos. 1-9, as originally filed,  
 Nos. \_\_\_\_\_, as amended under Article 19,  
 Nos. \_\_\_\_\_, filed with the demand,  
 Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the drawings, sheets/fig 1/2-2/2, as originally filed,  
 sheets/fig \_\_\_\_\_, filed with the demand,  
 sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1-9	YES
	Claims		NO
Inventive step (IS)	Claims	1-9	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-9	YES
	Claims		NO

### 2. Citations and explanations

D1: US-A-4 555 312

D2: EP-A-0 079 679

The present application concerns a continuous method for obtaining butenes from a C4 fraction.

Document D2 is the closest prior art document and differs from the subject matter of the present application in that the features of the characterizing part of claim 1 are not disclosed, that is the fact that a partial stream is withdrawn from the degassing zone of a separation stage situated downstream of the inlet of the bottom stream coming from the washing zone, and the partial stream is heated and/or evaporated by indirect heat exchange with the hot bottom stream flowing out of the degassing zone and returned to the degassing zone in the same separation stage or upstream thereof.

The technical problem is therefore considered that of providing an improved method for obtaining butenes from a C4 fraction. The solution is set out in claim 1. A person skilled in the art proceeding from the closest prior art would not have been able to derive that the features "a partial stream is withdrawn from the degassing zone of a

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separation stage situated downstream of the inlet of the bottom stream coming from the washing zone, and the partial stream is heated and/or evaporated by indirect heat exchange with the hot bottom stream flowing out of the degassing zone and returned to the degassing zone in the same separation stage or upstream thereof" would result in the energy reductions shown in the table on page 13 when a particular theoretical separation stage is selected.

The subject matter of claims 1-9 therefore meets the requirements of PCT Article 33(2) and (3).

The closest prior art document, document EP-A-0 079 679, should be mentioned in the application.